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1440.01 General

The Washington State Department of Transportation (WSDOT) is permitted, by an agreement with the Board of Registration for Professional Engineers and Land Surveyors, to practice land surveying “under the direct supervision of a licensed professional land surveyor OR a licensed professional engineer.” (See [Figures 1440-1a and b](#), Interagency Agreement.)

1440.02 References

Revised Code of Washington (RCW) 58.09, “Surveys – Recording”

RCW 58.20.120, “System designation – Permitted uses”

RCW 58.24.040(8), “. . . temporary removal of boundary marks or monuments”

Washington Administrative Code (WAC) 332-120, “Survey Monuments – Removal or Destruction”

WAC 332-130, “Minimum Standards for Land Boundary Surveys and Geodetic Control Surveys and Guidelines for the Preparation of Land Descriptions”

Interagency Agreement Between the Washington State Department of Transportation and the Board of Registration for Professional Engineers and Land Surveyors (1990)

Construction Manual, M 41-01, WSDOT

Highway Surveying Manual, M 22-97, WSDOT

Plans Preparation Manual, M 22-31, WSDOT
WSDOT Monument Database:

<http://www.wsdot.wa.gov/monument/>

1440.03 Procedures

For WSDOT projects, it is recommended that surveying activities include (if appropriate) but not be limited to the following items.

(1) During the Project Definition Phase

(a) Record any pertinent surveying information as detailed in the Design Documentation Check List at:

<http://www.wsdot.wa.gov/eesc/design/projectdev/>

(b) Research for recorded survey monuments existing within the project area.

(c) Determine and prioritize project survey needs and tasks to be completed. Needs and tasks may include:

- Cadastral issues
- Right of way issues
- Geodetic control issues
- Photogrammetry issues
- Other issues as needed

(2) During Design and Development of the Plans, Specifications, and Estimates

(a) The project manager and project surveyor hold a preliminary survey meeting, covering:

- Project schedule
- Anticipated survey requests

For preliminary survey meeting specifics and roles and responsibilities of the project manager and project surveyor, see the *Highway Surveying Manual*.

(b) Perform field reconnaissance, mark existing recorded survey monuments, and determine the location of possible new survey monuments. Also, mark found unrecorded monuments for preservation if practical.

(c) Determine the impact to geodetic monuments and notify the Headquarters (HQ) Geographic Services Office.

(d) Refer to the *Highway Surveying Manual* to:

- Convert Washington State plane coordinates to project datum.
- Document the procedure and combined factor used for converting between datums.
- Determine survey collection methods.
- Collect primary, secondary, and tertiary survey data.
- Process and import secondary, tertiary, or other survey data into design software for use by designers.

(e) Apply to the Department of Natural Resources (DNR) for permits for monuments that will be disturbed or removed (Chapter 1450).

(f) Archive new primary and secondary survey control data in the WSDOT Monument Database and GIS, as appropriate, for future retrieval.

(g) Ensure that all survey monuments within the project right of way are shown on the contract plans in order to avoid accidental damage.

(h) Develop a Record of Survey (RCW 58.09) or a Monumentation Map as required (Chapter 1450).

(3) After Construction is Completed

(a) Complete a “Post Construction” survey as described in the *Highway Surveying Manual* and the *Construction Manual*.

(b) Have the DNR Completion Report signed and stamped by the appropriate professional in direct charge of the surveying work, then file with DNR as described in Chapter 1450.

1440.04 Datums

A datum is a geometrical quantity (or set of quantities) that serves as a reference, forming the basis for computation of horizontal and vertical control surveys in which the curvature of the earth is considered. Adjusted positions of the datum, described in terms of latitude and longitude, may be transformed into state plane coordinates.

All engineering work (mapping, planning, design, right of way, and construction) for WSDOT projects is based on a common datum.

(1) Horizontal

WAC 332-130-060 states, “The datum for the horizontal control network in Washington shall be NAD83 (1991) [the North American Datum of 1983] as officially adjusted and published by the National Geodetic Survey of the United States Department of Commerce and as established in accordance with chapter 58.20 RCW. The datum adjustment shall be identified on all documents prepared; i.e., NAD83 (1991).” For further information, see the *Highway Surveying Manual*.

(2) Vertical

The North American Vertical Datum of 1988 (NAVD88) as defined by the National Geodetic Survey (NGS) is the official civilian datum for surveying and mapping activities in the United States. WSDOT has adopted this datum. For further information, see the *Highway Surveying Manual*.

1440.05 Global Positioning System

A Global Positioning System (GPS) uses a constellation of satellites and earth stationed receivers to determine geodetic positions (latitude and longitude) on the surface of the earth. WSDOT personnel use this survey technology. (See the *Highway Surveying Manual* for more detailed discussions.)

GPS technology is changing rapidly. The key point is for the designer and surveyor to select the best tool (GPS or conventional applications) for doing the survey fieldwork. Oftentimes a combination of GPS and conventional (Total Station) surveying is appropriate.

1440.06 WSDOT Monument Database

The WSDOT Monument Database provides storage and retrieval capabilities for data associated with survey control monuments set by WSDOT. This database supports and tracks the Report of Survey Mark and aids in fulfilling WSDOT's obligation to contribute to the body of public record, thereby minimizing the duplication of survey work. The Report of Survey Mark provides data on specific GPS stations. (See Figure 1440-2 for an example of a Report of Survey Mark.)

To access the WSDOT Monument Database, see the following web site:

<http://www.wsdot.wa.gov/monument/>

1440.07 Geographic Information System

The Geographic Information System (GIS) is a collection of information from many sources. Its purpose is to assemble data into a central database for the common good. The data is stored on many levels so that the desired information can be selected and combined to achieve the desired product. Surveying and photogrammetric data are vital elements of this system.

1440.08 Photogrammetric Surveys

Photogrammetric surveys are performed to furnish topographic or planimetric maps and cross sections for use in the reconnaissance, location, and preliminary design phases of highway work. To use photogrammetric surveys for final design and construction requires that the ground be nearly bare to obtain the necessary accuracy. By using well-planned aerial photography in stereoscopic plotters, contours and other physical features are delineated on map sheets to a scale consistent with the accuracies or detail required.

The usefulness of aerial photography is not limited to mapping. Taking the form of enlargements, mosaics, and digital images, it can be used as a visual communication tool (displays and exhibits) for planning, design, property acquisition, engineering, construction, litigation, and public relations.

To obtain information on preparation, procedure, and programming of aerial photography and photogrammetric mapping and applications, contact the HQ Geographic Services Office. When requesting a photogrammetric survey, specify the desired units and check the units of the product. Allow for the time required to communicate the complex and detailed work request, develop the service, and accomplish the product.

1440.09 Documentation

For documentation related to monuments, see Chapter 1450.

Primary and secondary survey control data are archived in the WSDOT Monument Database and GIS when available.

The documents required to be preserved in the Design Documentation Package (DDP) or the Project File (PF) can be found on the following web site:

<http://www.wsdot.wa.gov/eesc/design/projectdev/>

**INTERAGENCY AGREEMENT BETWEEN
THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
AND THE BOARD OF REGISTRATION FOR PROFESSIONAL
ENGINEERS AND LAND SURVEYORS**

THE FOLLOWING Interagency Agreement is hereby entered into between the Washington State Department of Transportation (hereafter referred to as "WSDOT") and the Washington State Board of Registration for Professional Engineers and Land Surveyors (hereafter referred to as "BOARD").

I

DECLARATIONS OF THE PARTIES

- A. WHEREAS the BOARD has the exclusive authority to regulate the practice of engineering and land surveying in Washington; and
- B. WHEREAS WSDOT employees are required to practice land surveying as defined by RCW 18.43.020 in carrying out the program of said agency; and
- C. WHEREAS WSDOT is exempted from necessarily using a licensed land surveyor to perform said surveys in accordance with the provisions of the Survey Recording Act, RCW 58.09.090; and
- D. WHEREAS both the BOARD'S and WSDOT'S goals include the performance of land surveys in conformance with recognized standards of practice and relevant laws and administrative codes in order to safeguard life, health, and property; and
- E. WHEREAS the parties to the Agreement agree to the following Principles of Agreement.

II

PRINCIPLES OF AGREEMENT

- A. The practice of land surveying performed by WSDOT employees shall be under the direct supervision of a licensed professional land surveyor OR licensed professional engineer. Said licensee shall hold a valid Washington license issued in conformance with RCW 18.43.
- B. All surveys performed by WSDOT employees shall be performed in accordance with the Survey Standards promulgated under Chapter 332-130 WAC.
- C. When a survey has been performed by WSDOT employees a survey map shall be prepared and filed with the county engineer in compliance with RCW 58.09.090(1)(a). Said map's contents shall be in conformance with the requirements of RCW 58.09.060 and WAC 332-130. Furthermore, said map shall contain the stamp and signature of the licensee who was in direct responsible charge of the work.

Interagency Agreement
Figure 1440-1a

- D. A record of corner information shall be filed in accordance with RCW 58.09.040(2) and 58.09.090(2) where WSDOT employees replace or restore an existing or obliterated general land office corner. Said record of corner information shall be signed and stamped by the professional land surveyor or professional engineer responsible for said work.
- E. The temporary removal or destruction of any section corner or any other land boundary mark or monument shall be permitted if performed in compliance with RCW 58.24.040(8).
- F. Whether performed by a licensed professional engineer or a licensed professional land surveyor, any surveys performed by WSDOT shall be in accordance with the standards generally expected of those practicing professional land surveying.

IN WITNESS WHEREOF: The Washington State Department of Transportation and the Board of Registration have signed this Agreement.

/s/ Ed W. Ferguson

Ed W. Ferguson, PE
DEPUTY SECRETARY
Department of Transportation

January 5, 1990
Date

This Agreement approved by motion of the Board dated January 19, 1990.

/s/ Wesley E. Taft

Wesley E. Taft, PE
CHAIRMAN, Board of Registration

January 19, 1990
Date

Interagency Agreement
Figure 1440-1b

SURVEY INFORMATION SYSTEM

Report of Survey Mark

GENERAL MONUMENT INFORMATION

Designation:	GP29530-21	T.R.S:	31N, 5E , 2	<u>ACCOUNTS INFORMATION</u> BOOK PROJECT INVOICE 49 0L2030 23-94042
Monument ID:	8	Corner Code:		
State:	WASHINGTON	State Route:	530	
County:	SNOHOMISH	Mile Post:	20.590	
Region:	NW	Station:		
Nearest Town:	ARLINGTON	Offset:		
Usgs Quad:	ARLINGTON WEST	Owner:	GS	
		Bearing:	M	

Description

TO REACH THE STATION FROM THE INTERSECTION OF SR 530 AND SR 009 AT ARLINGTON, GO WEST 0.2 MILES ALONG SR 530 TO THE STATION ON THE RIGHT. IT IS LOCATED 1.1 METERS SOUTH OF A WITNESS POST, 33.5 METERS WEST OF THE APPROXIMATE CENTERLINE OF DIKE ROAD AND 1.2 METERS NORTH OF A GUARD RAIL. THE STATION IS A STANDARD WSDOT BRASS DISK SET IN A ROUND CONCRETE MONUMENT PROJECTING 0.2 FEET ABOVE THE GROUND. NOTE: 'POSITION UP-DATE BY OCCUPYING WITH G.P.S.' NOTE: TIED TO HPN 4/94. THIS IS A NAVD88 UPDATE.



CURRENT SURVEY CONTROL

<u>DATUM</u>	<u>LATITUDE</u>	<u>UNIT</u>	<u>LONGITUDE</u>	<u>UNIT</u>	<u>NETWORK</u>	<u>METHOD</u>	<u>ACCURACY</u>
NAD 83/91	48 11 54.567381	N	122 08 03.530464	W	PRIMARY	GPS	2 CM

Report of Survey Mark
Figure 1440-2